

6-17-11/4/3  
2

# A Simple Method of SEXING DAY-OLD RINGNECK PHEASANT CHICKS



RESEARCH CIRCULAR NO. 2  
PENNSYLVANIA GAME COMMISSION  
Harrisburg, Pa.  
1942

Page 34  
1940



## Pennsylvania Game Commission

ROSS L. LEFFLER, *President*.....McKeesport  
ROBERT LAMBERTON, *Vice President*.....Franklin  
COL. NICHOLAS BIDDLE.....Bethayres  
A. W. LEE, JR.....Clearfield  
O. BEN GIPPLE.....Harrisburg  
S. HAROLD FISHER.....Huntingdon  
HAROLD MOLTZ .....Williamsport

---

SETH GORDON.....*Executive Director*  
R. A. McCACHIRAN.....*Acting Assistant Director*

# A SIMPLE METHOD OF SEXING DAY-OLD RINGNECK PHEASANT CHICKS

by

ROGER M. LATHAM

*Division of Propagation and Research*

## INTRODUCTION

The desirability of developing a simple method of determining the sex of day-old ringneck pheasant chicks has long been recognized by game breeders, research workers and others interested in the species. This need is doubtless due largely to the highly contrasting difference in the plumage of mature individuals of the two sexes, together with the polygamous habits of the bird, which have led to the adoption of certain legislative restrictions, such as the "cock law," pertaining to its management.

The practical uses of such a technique are many. For example, in Pennsylvania, where the shooting of only male ringnecks has been permitted for almost 20 years, the State Game Commission requires for its spring stocking program far more male than female pheasants. To date, however, the production of one thousand cock birds has necessitated the rearing of approximately two thousand individuals of unknown sexes to six or eight weeks of age, when the characteristic plumage differences are first discernible. The practical advantages of being able to rear birds in any desired proportion of sexes are, therefore, obvious. Similar benefits would accrue in the case of those operating private shooting preserves. Also, particularly in the Eastern States, the ability to raise birds in any desired sex ratio frequently means to commercial propagators the difference between making a profit and suffering a loss. Finally, such a technique is at times sorely needed by technical investigators.

Since the anal method of sexing commonly utilized with domestic chicks requires special training and is relatively difficult in the case of birds as small as pheasants, the writer was assigned the task of

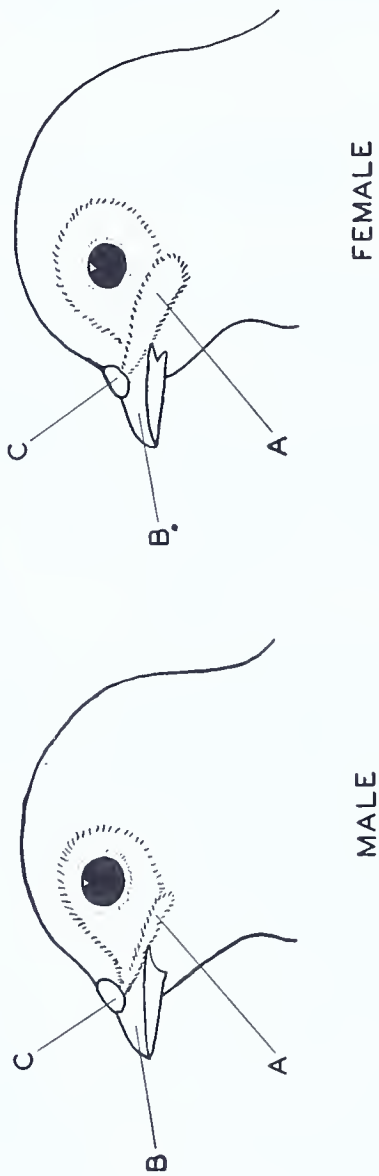


FIGURE 1

**OUTLINE DRAWING DAY-OLD PHEASANT CHICKS  
SHOWING MALE AND FEMALE CHARACTERISTICS**

LEGEND: "A"-STRIP OF LONG DOWN. "B"-UPPER MANDIBLE. "C"-CERE.

developing a more simple technique which could be practically applied by any game bird propagator or research worker. That finally worked out is described and discussed in the following section of this circular.

The writer wishes to acknowledge with thanks the assistance of Richard Gerstell, Chief of the Division of Propagation and Research of the Pennsylvania Game Commission, and John D. Beule, Investigator at the Commission's Loyalsock Experiment Station, who aided in the development of the technique. He is also grateful to Professor E. W. Callenbach of the Department of Poultry Husbandry of the Pennsylvania State College and to Superintendent Earl S. Greenwood of the Loyalsock State Game Farm for their cooperation in testing the method both on a scientific as well as a practical basis.

## THE METHOD

In the ringneck chick, **the shape and extent of the cheek patch, or eye field, is used as the sex indicator.** (The variations in color and markings of the down are completely disregarded.) Regnier (1) says in regard to adult birds, "The cheeks of the male are ornamented with scarlet, turgid, papillary tissues which undergoes seasonal changes of form, size and shape of the papillae. Its coloration is due in part to a zooerythrine, localized as a cytoplasmic inclusion in the basal portion of the malpighian layer. The cheeks of the female possess neither papillae nor red pigment." In the day-old chick, the cheek patch of both sexes is entirely covered with natal down. This is shorter than that covering the surrounding areas, thus producing a definite outline surrounding the eye field.

The down-covered field of the typical female chick is more nearly round than that of the male and in some instances forms an almost perfect circle. Extending from the nasal opening posteriorly downward along approximately one quarter of the circumference of cheek patch, runs an unbroken, comparatively wide strip of longer down [Figure 1 (a)]. This varies from about one-sixteenth to three thirty-seconds of an inch in width.

In the male, the eye field is rounded at the back of the head, but is definitely angular on the side extending forward toward the bill. This pointed section protrudes far into the "V" formed by the upper mandible [Figure 1 (b)] and the cere [Figure 1 (c)], thus greatly reducing the width of that strip of long down so characteristic of the female chick [Figure 1 (a)].



**Though not a positive indicator of sex,** it may be helpful to know that in profile the line formed by the forehead and the upper mandible is usually more nearly straight in the case of males than among females. In other words, as a rule, the foreheads of the females rise more abruptly from the beaks than do those of the males [Figures 1, 2 and 3].

It was discovered in developing the technique that in addition to those individuals exhibiting either typical male or female eye patches, a small percentage of the chicks were of an intermediate type, showing both male and female characteristics. In this group, a portion of the eye field enters the "V" posterior to the upper mandible as in typical males, yet the strip of down immediately below is of sufficient width to be characteristic of females. It has so far been impossible accurately to sex individuals of this type. It is, however, not unlikely that further use of the method and continued experimentation will make possible a reduced percentage of birds which must be so classified, or perhaps eliminate them entirely.

Typical specimens of each of the three groups, male, female and intermediate, are portrayed in Figures 2 and 3.

## ACCURACY OF THE TECHNIQUE

Two tests of the accuracy of the technique have been made. The first was performed by Professor E. W. Callenbach of the Pennsylvania State College, who regularly conducts tests for those persons wishing to obtain sexing certificates from the International Baby Chick Association. For this a total of 148 day-old birds was available. These were first divided into male, female and intermediate groups. Each was then sexed separately. The resulting data are presented in Table 1. This shows that the combined accuracy for all types of birds was 89.9%. For the male group, it ran 96.3%; for the female lot 97.3%; but for the 19 intermediates only 42.1%.

The second check was made under actual game farm conditions. In a period of a little less than one hour, 560 individuals, representing the total number normally placed in two colony brooder houses, were sexed as removed from the incubator and divided into two groups, each believed to contain individuals of only one sex. These were placed in separate houses in the regular farm brooder field where they were cared for in the customary manner along with other birds from the same hatch. All individuals which perished during



MALE



INTERMEDIATE



FEMALE

FIGURE 2

# TYPICAL RINGNECK PHEASANT CHICKS

the brooding period were sexed by anatomical dissection, while the remainder were checked after adult plumage was attained. The data obtained are presented in Table II. The combined accuracy in this case was 95.0%, while that for males was 94.7% and for females 95.6%.

On the basis of these tests, together with the knowledge and experience gained from the investigation, it is believed that, with limited practice, any experienced pheasant propagator, or any interested research worker, can sex newly-hatched ringneck pheasants with better than 90% accuracy just as soon after removal from the incubator as the down on the head has thoroughly dried. Furthermore, the older the birds become, the more pronounced are the sexual characteristics, thus increasing the possible accuracy among such individuals.

SUMMARY

A method of sexing day-old and growing ringneck pheasant chicks has been described. This is based on the feather development in and around the eye field. Tests of the method indicate that it can be practically applied by game bird propagators and research workers with a minimum accuracy of 90%.

LITERATURE CITED

(1) Regnier, V. Remarques  
1926. Sur le conditionnement physiologique du "rogue" de Faisan. Compt. Rend. Soc. Biol. 95 (22): 171.

TABLE I.  
ACCURACY TEST SEXING DAY-OLD RINGNECK  
PHEASANT CHICKS

Laboratory Check by Prof. E. W. Callenbach, Department Poultry  
Husbandry, Pennsylvania State College, State College, Penna.

CLASSIFICATIONS	Males	Females	Inter- mediates	Total
Numbers classified as .....	54	75	19	148
Numbers correctly classified ...	52	73	8	133
Numbers incorrectly classified ..	2	2	11	15
Percentage correctly classified ...	96.3%	97.3%	42.1%	89.9%
Percentage incorrectly classified..	3.7%	2.7%	57.9%	10.1%





MALE



INTERMEDIATE



FEMALE

FIGURE 3

TYPICAL RINGNECK PHEASANT CHICKS

**TABLE II.**  
**ACCURACY TEST SEXING DAY-OLD RINGNECK**  
**PHEASANT CHICKS**

**Actual Operations Check Performed at Loyalsock State Game  
Farm at Montoursville, Penna.**

CLASSIFICATIONS	Males	Females	Total
Numbers classified as .....	280	280	560
Numbers correctly classified .....	265	267	532
Numbers incorrectly classified* ..	15	13	28
Percentage correctly classified ....	94.7%	95.6%	95.0%
Percentage incorrectly classified..	5.3%	4.4%	5.0%

\* Includes all escapes.

COPYRIGHT 1942  
PENNSYLVANIA GAME COMMISSION  
HARRISBURG, PA.















